

WHAT IS CLAIMED IS:

1. A lithographic apparatus, comprising:
 - an illumination system constructed to provided a beam of radiation;
 - a support structure constructed to support a patterning device, said patterning device serving to impart a cross-section of said beam with a pattern to form a patterned beam;
 - a substrate table for holding a substrate;
 - a projection system that projects said patterned beam onto a target portion of said substrate;
 - a collector being constructed to receive radiation from a first radiation source and transmit radiation to said illumination system; and
 - at least one heater for heating said collector when said collector receives substantially no radiation from said first radiation source.
2. An apparatus according to claim 1, wherein said heater includes a second radiation source.
3. An apparatus according to claim 1, wherein said heater includes an electrical heater.
4. An apparatus according to claim 1, wherein said collector includes reflecting elements with reflecting inner surfaces for reflecting said radiation which is received from said first radiation source towards a focussing point.
5. An apparatus according to claim 4, wherein said heater is arranged to supply heat to said reflecting elements of said collector.
6. An apparatus according claim 4, wherein

at least one of said radiation reflecting elements is coupled to heat conducting elements, wherein said heater is constructed to heat said reflecting elements by heat transfer through said heat conducting elements.

7. An apparatus according to claim 1, wherein
said heater is connected to a controller that is constructed to control said heater.
8. An apparatus according to claim 1, further comprising:
one or more temperature sensors for measuring at least a temperature of at least part of said collector.
9. An apparatus according to claim 2, wherein
said heater includes an electrical heating layer for conducting a heating current, wherein said thickness of said heating layer is predetermined for producing the desired local resistance of said heating layer.
10. An apparatus according to claim 9, wherein
said heating layer comprises at least one vacuum compliant substance.
11. An apparatus according to claim 10, wherein
said at least one vacuum compliant substance is nickel.
12. An apparatus according to claim 1, wherein
said first radiation source is an intermittent radiation source that is structured to produce radiation intermittently.
13. A collector for use in a lithographic apparatus, said collector comprising:
reflecting elements being constructed to receive radiation from a first radiation source, each of said reflecting elements having a reflecting surface to reflect the radiation received from the first radiation source towards a focussing point; and
a heater thermally coupled to said reflecting elements and constructed to heat said reflecting elements.

14. A method of manufacturing a device, comprising:
 - providing a substrate;
 - providing a first radiation source;
 - transmitting radiation from the first radiation source to an illumination system through a collector;
 - providing a beam of radiation using the illumination system;
 - imparting the beam with a cross-sectional pattern to form a patterned beam of radiation; and
 - projecting the patterned beam of radiation onto a target portion of the substrate;and
 - maintaining the collector at a substantially constant operating temperature by selectively heating the collector.
15. A method according to claim 14, wherein
 - the maintaining the collector includes heating the collector substantially only when the collector receives substantially no radiation from the first radiation source.
16. A method according to claim 14, wherein
 - the maintaining the collector includes heating the collector continuously to the operating temperature such that further heating caused by absorption of radiation from the first radiation source leads to substantially no change of the temperature of the collector.
17. A method according to claim 14, wherein
 - the maintaining the collector includes the collector receiving radiation pulses from the first radiation source.
18. A method according to claim 14, wherein
 - the maintaining the collector includes using electricity to heat the collector.
19. A method according to claim 18, wherein

the maintaining the collector includes heating the collector by at least one further radiation source.

20. A method according to claim 14, wherein
the maintaining the collector includes maintaining the temperature of the collector within a predetermined range from an average operating temperature.

21. A method according to claim 14, wherein
the maintaining the collector includes producing different amounts of heat for heating different parts of the collector and wherein the different amounts of heat are correlated to the amounts of radiation received by the different parts of the collector from the first radiation source.

22. A method according to claim 14, wherein
the transmitting radiation includes transmitting radiation intermittently.

23. A method according to claim 14, wherein
the maintaining the collector includes activating the heater when the first radiation source is deactivated.

24. A method according to claim 14, wherein
the maintaining the collector includes activating the heater when a drop of the temperature of the collector is detected.

25. A method according to claim 14, wherein
the maintaining the collector includes maintaining a part of the collector at a predetermined, substantially constant operating temperature.

26. A method according to claim 14, wherein
the maintaining the collector includes maintaining a part of said collector within a range from an average operating temperature.

27. A method according to claim 14, wherein
the maintaining the collector includes heating a part of the collector while the collector simultaneously receives radiation from the radiation source.
28. A method according to claim 14, wherein
the maintaining the collector includes producing different amounts of heat for heating different parts of the collector, wherein the different amounts of heat are correlated to the amounts of radiation received from the first radiation source by each of the respective, different collector parts.
29. A method according to claim 14, further comprising:
providing a heating layer to the collector; and
selecting a thickness for the heating layer corresponding to the desired local resistance of the heating layer.
30. A lithographic apparatus, comprising:
receiving and transmitting means for receiving radiation from a first radiation source and transmitting radiation to an illumination system; and
means for heating said receiving and transmitting means.
31. A lithographic apparatus according to claim 30, further comprising:
means for controlling said means for heating to maintain said receiving and transmitting means in a predetermined temperature range.
32. A method of manufacturing a device, comprising:
transmitting radiation from a first radiation source to an illumination system through a collector;
maintaining the collector at a substantially constant operating temperature by selectively heating the collector; and
projecting a beam of radiation onto a target portion of a substrate.